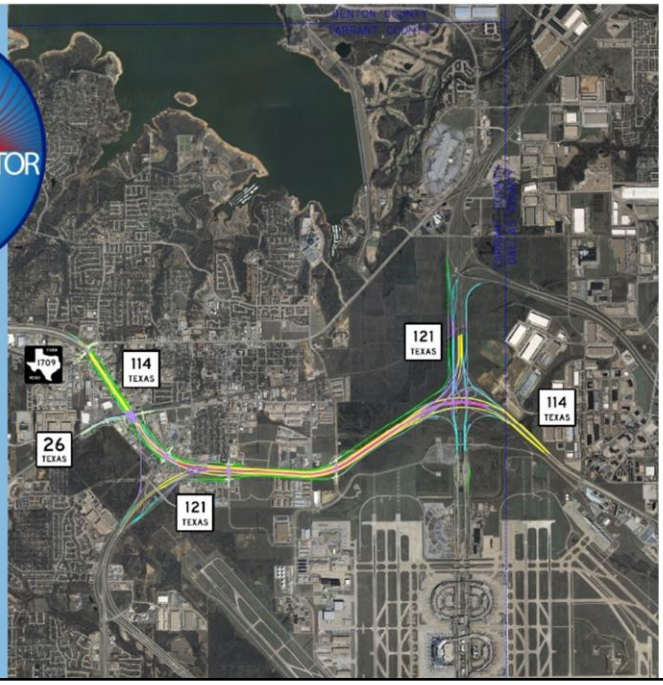
Rob Anderson – Kiewit Infrastructure, Deputy Director on the DFW Connector Project

Justin Mannina – Kiewit Infrastructure, Project Engineer on the DFW Connector Project

DFW CONNECTOR

Improvements by 2014

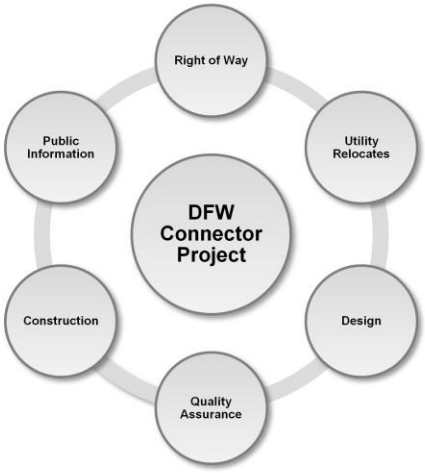


txdot.gov

KEYWORD:
DFW Connector

One-stop-shop

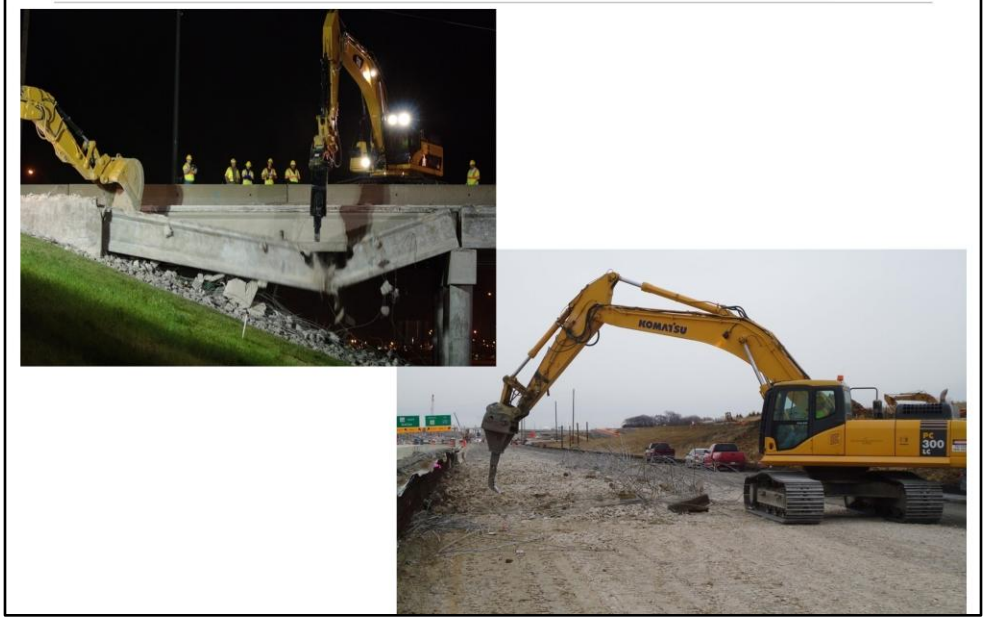
- ROW
- Utilities
- Design
- Quality Assurance
- Construction
- Public Information



More scope than Design-Build

Right-of-Way Acquisition
Utility Agreement Negotiation, Agreements and Relocations
Design
Public Information and Outreach
Construction
Quality Acceptance (PSI)

Demolition and Removals



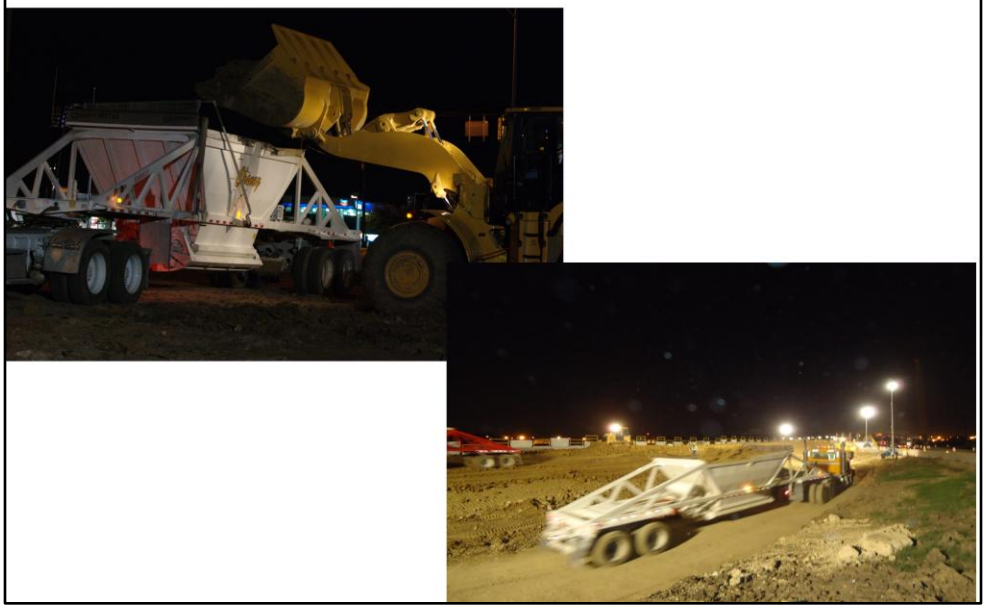
Total of 3.5 million manhours on the project, 2.6 , million direct manhours

We will successfully recycled more than 600,000 tons of concrete 175,000 tons asphalt and metal.

A total of 18 bridge will be demolished on the project and 600,000 SY of Concrete paving will be removed

In comparison to waste that is hauled to a landfill, the project is recycling at a rate of 99 percent.

Earthwork



Exc to Emb 3.2million Cy on the project to-date

60% of the dirt is moved in legal hauls at night

The dirt in this area is highly expansive material with PI's ranging from 15 to 35

Subgrade Stabilization

Pavement section is over 4 ft thick
13” Concrete
2 ½” of asphalt bond breaker
12” Crushed aggregate base
24” lime treated sub-grade

1.5M SY of lime treated sub-grade on the project

Drainage

125,000 LF total drainage on the project

1,500 ea inlets

Walls

800,000 sf total wall area (550,000sf of MSE and 250,000 SF of soil nail)

Structures

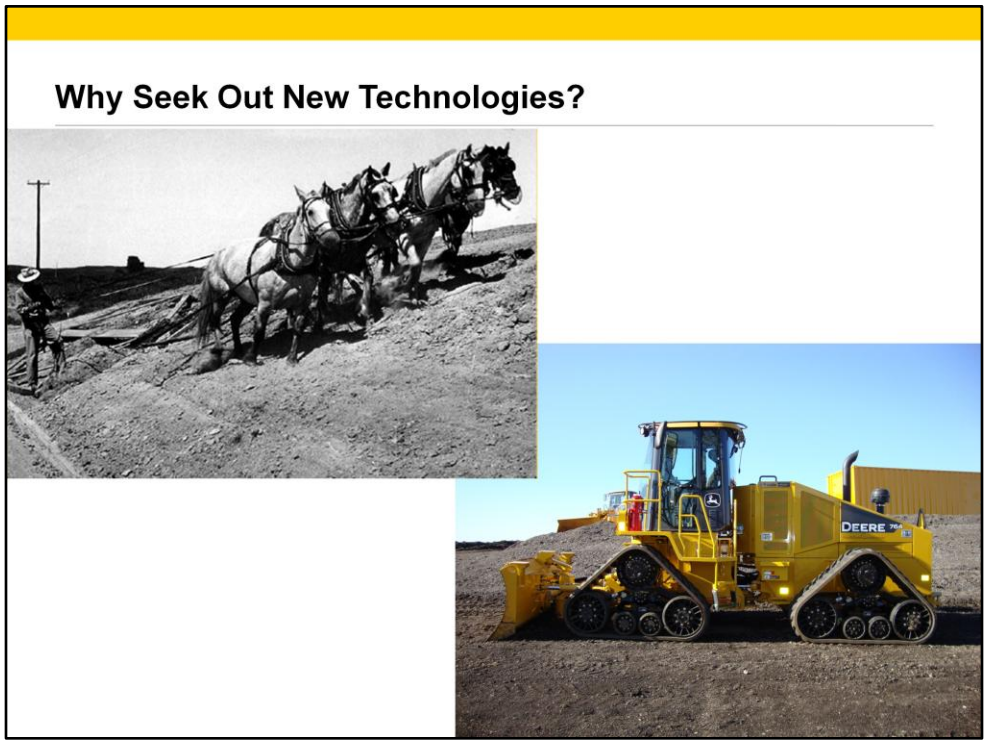
25,000 LF of the 40,000 LF of drilled shafts completed

611 of the 1,973 concrete girders set

1,500,000 sf of deck area on 38 bridges with 67,000 CY of concrete

Concrete Paving

1,500,000 SY of PCCP or 538,000 CY



The rate of evolution in our industry is very slow when compared to other industries such as computers, electronics, medical, and communication.

The projects and products we deliver tend to rely on old standards and methods of measurements. Under the low bid format there little incentive to find better solutions.

On the DFW Connector Project we chose to through break through those boundaries that previously kept us from seeking more modern and efficient methods and products. Fortunately we had a contract model that allowed some of this innovation but further our client TxDOT was also willing to a point to embrace our pursuit of innovation.

To help us with our mission of modernizing our business on the DFW Connector Project we selected 6 young individuals with less than 3 years experience in our industry to seek out technologies that would:

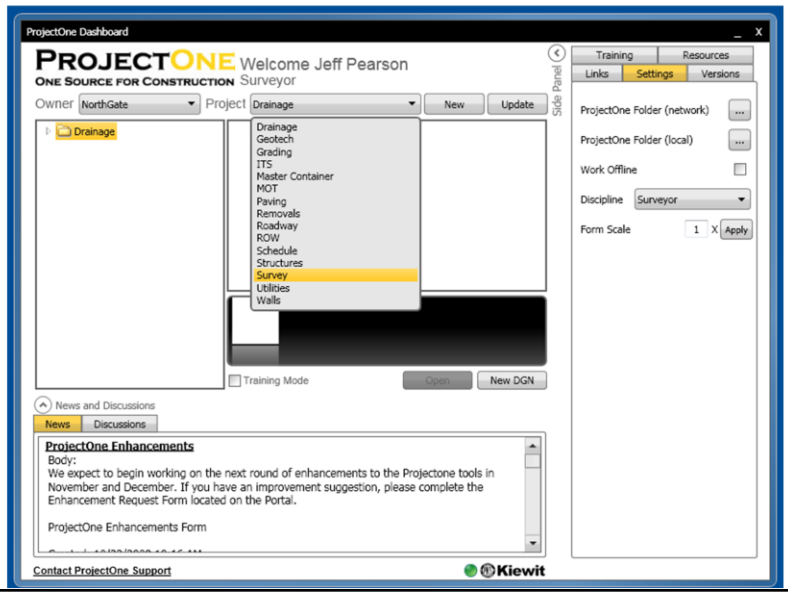
1) Make us safer
2) Improve our compliance with environmental and regulatory requirements
3) Produce higher quality work
4) Reduce effort to compete the work make us more efficient and accurate

These individuals were not tainted with the old addage of “that’s the way we have always done it…”. They were able find technologies inside and outside our industry that have met our goals. Today we will share with you some of them,

Kiewit

3-D Modeling

Project One

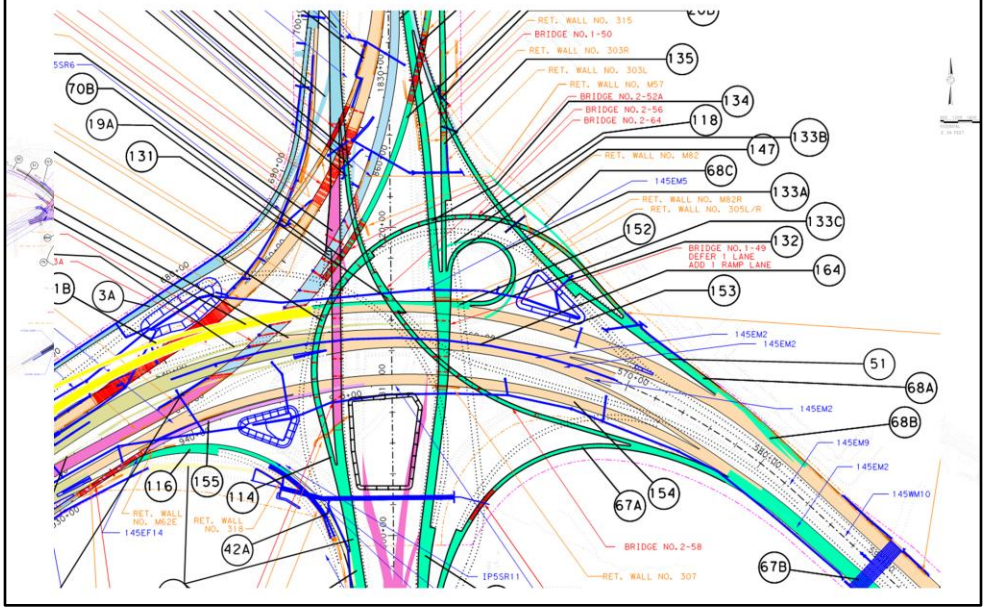


ProjectOne is a Kiewit tool used to organize, manage, and manipulate CAD data in various files via Microstation, InRoads or Trimble Business Center.

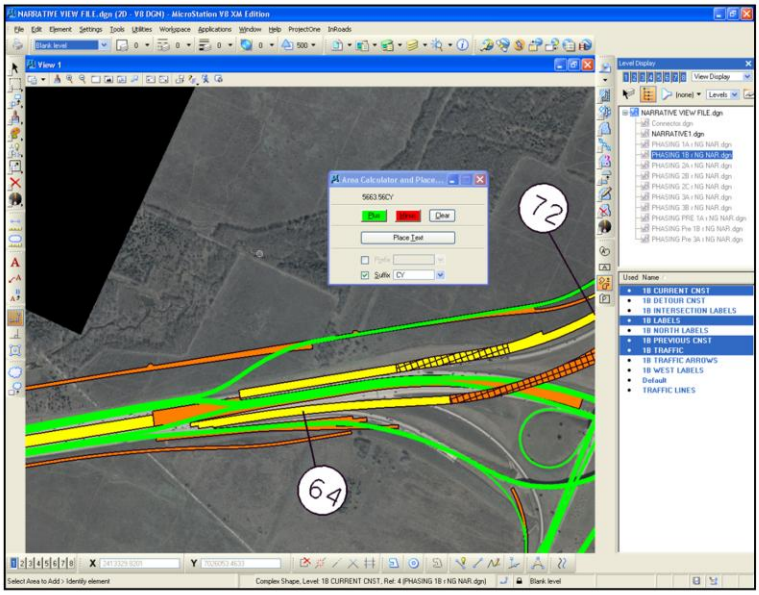
- Interim (30%) Design, and separate from daily updated files
- Takeoffs based on Interim design stored here
- Able to track design progress and growth by comparing takeoff files to updated design files

•Use live working files to develop operation work plans and strip maps

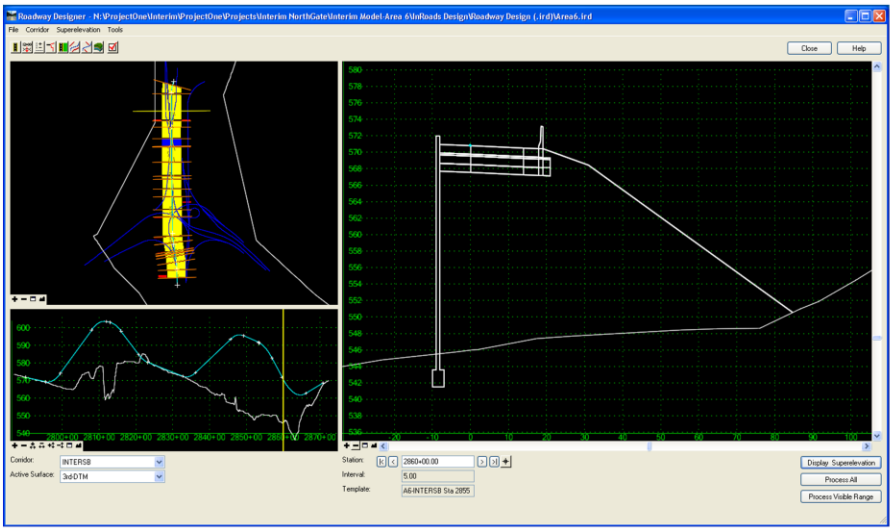
Manageable Pieces of Work



Phasing & Scheduling

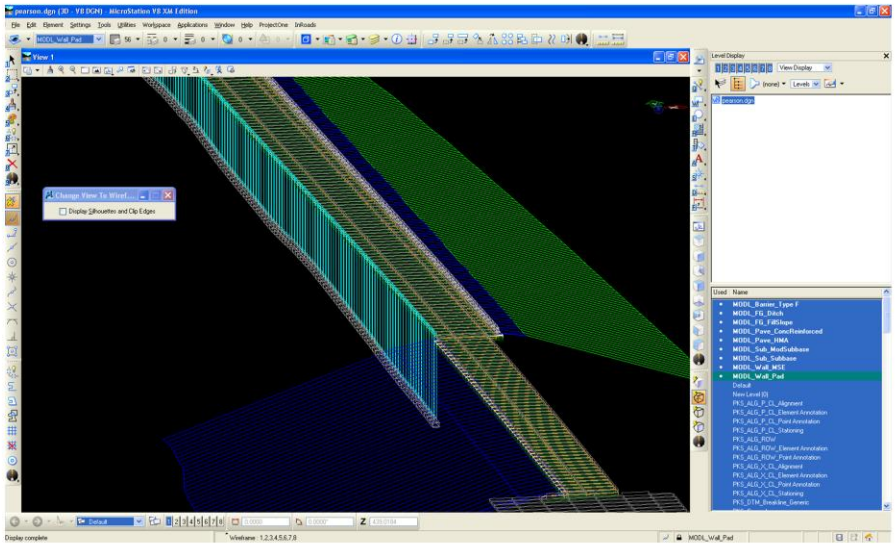


Microstation / InRoads



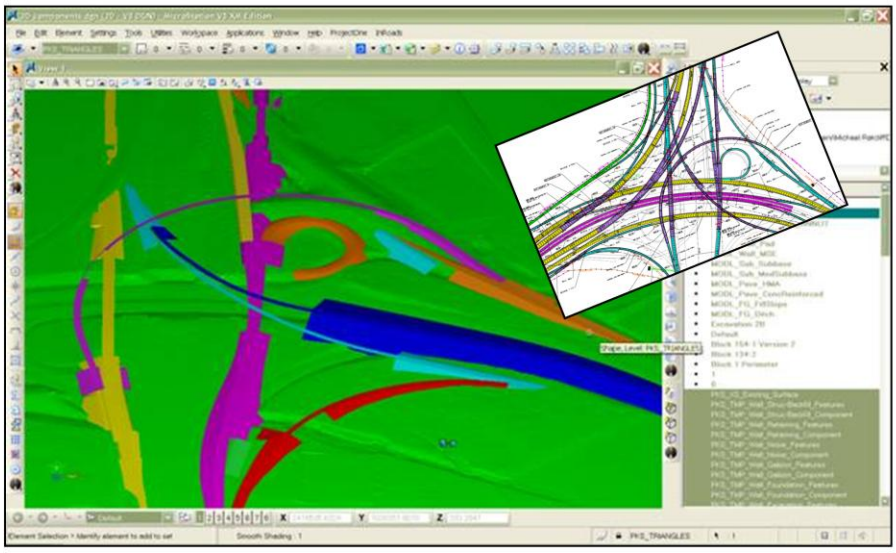
- Technical Goals
  - Maximize efficiency and reduce rework by modeling the project in the office before building it in the field
    - Build schedule and phasing scheme before the work starts
    - Analyze model data to identify constructability issues and possible refinements
    - Use model data to perform takeoffs and quantity tracking with more automation and accuracy
    - Streamline the process of transferring model data from the office to the field and back
- Technical Challenges
  - Use the most current model data to make the most effective decisions
    - Realize “The Model” is not a turnkey product, but a process that will be complete after the design is complete
    - Ensure the whole project is using the most current model data but still has access to previous data to track design growth
    - Integrate all available project components and design into one or more useable working products
    - QA/QC the model data to verify accuracy everywhere, not just in 2D, on the schedule, or at 100’ cross section intervals
    - Delivering/receiving model data and components in the most useful format at the right time
- Technical Benefits
  - What are the anticipated benefits of integrating this technology?
    - Reduce survey manhours by taking 3D data directly from designer instead of re-creating 3D data from paper sheets
    - Reduce constructability issues by having designers, engineers, and survey review model data
    - Analyze conflicts in the model data and resolve issues before they get to the field
    - Reduce time and effort in accurately transferring model data from the office to the field and back
    - Track issues or changes to the project and realize the impacts on schedule and constructability in real-time

3D Modeling



Here you see a 3D view of model components in Microstation

3D Quantity Take-Offs



- Quantity Take-off Overview
  - Performed by NorthGate Engineers while the phasing plan was being developed
    - NorthGate Engineers were trained on the efficient use of "Microstation"
    - By utilizing the Microstation files that were created during the phasing process, Quantity Take-offs were performed by discipline, for each element of work within each Block
      - Quantity Takeoff Demonstration
        - One click in Microstation can tell us how many cubic yards of concrete paving there is in Block 64
        - One click can also tell us LBS of Rebar, SY or CY of Lime Treatment, Tons of Bond Breaker, LF of Pipe or Box, Etc…
        - Microstation can also be utilized with other programs like "Terramodel" or "InRoads" to produce grading quantity take-offs
      - Microstation can also be used to create additional levels of detail such as:
        - Paving Strip Maps (right)
        - Access/Staging Plans
        - Sequencing Plans
        - Cut/Fill Diagrams
        - Etc…

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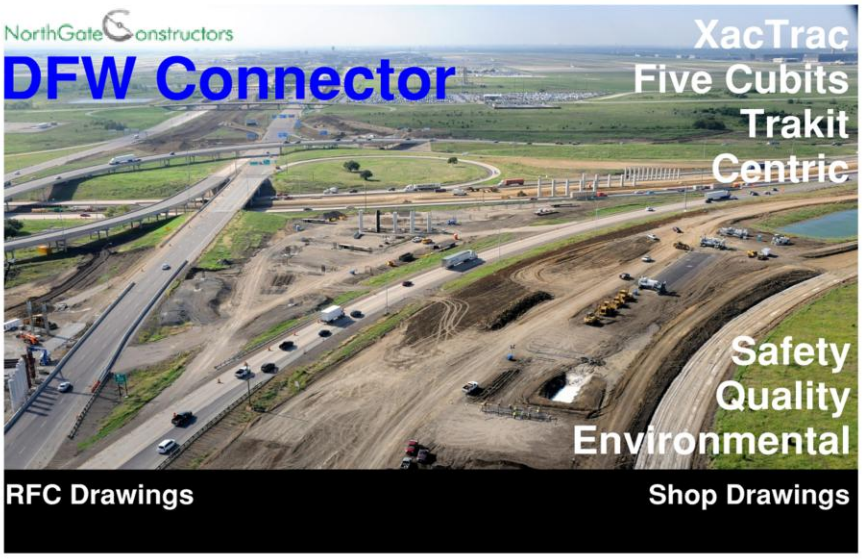
Virtual Plan Table

VPT Dashboard



RFC Drawing Master Index

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*	5GN102	INDEX OF SHEETS		
*	5GN103	INDEX OF ROADWAY STANDARDS		
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	0GN110-0GN113	Reserved		
	5RD002-5RD019	Reserved		
	5RD020	TYPICAL SECTIONS - EXISTING SH114		
*	5RD021	TYPICAL SECTIONS - SH114		
*	5RD022	TYPICAL SECTIONS - SH114		
*	5RD023	TYPICAL SECTIONS - SH114		
*	5RD024	TYPICAL SECTIONS - SH114		
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*	5RD027	TYPICAL SECTIONS - SB121B		
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*	5RD030	TYPICAL SECTIONS - NB121B		
	5RD031	TYPICAL SECTIONS - DCE114SIP		
*	5RD032	TYPICAL SECTIONS - DCE114NIP		
*	5RD033	TYPICAL SECTIONS - RMPSTX		
*	5RD034	TYPICAL SECTIONS - RMPNE121		
*	5RD035	TYPICAL SECTIONS - RMPNTX		
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*	5GN942	HORIZONTAL ALIGNMENT DATA - MAINLINE SH114		
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*	5RD053	ROADWAY PLAN - SH 114 (LEFT)		
*	5RD054	ROADWAY PLAN - SH 114 (LEFT)		
*	5RD055	ROADWAY PLAN - SH 114 (LEFT)		
*	5RD056	ROADWAY PLAN - SH 114 (LEFT)		
*	5RD057	ROADWAY PLAN - SH 114 (LEFT)		
*	5RD058	ROADWAY PLAN - SH 114 (LEFT)		
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*	5RD062	ROADWAY PLAN - SH 114 (RIGHT)		
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	5RD069	OMITTED		
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*	5RD072	ROADWAY PLAN - INTER (LEFT)		
	5RD073	OMITTED		
	5RD074	OMITTED		
*	5RD075	ROADWAY PLAN - INTER (RIGHT)		
*	5RD076	ROADWAY PLAN - INTER (RIGHT)		
*	5RD077	ROADWAY PLAN - SB 121B (LEFT)		
*	5RD078	ROADWAY PLAN - SB 121B (LEFT)		
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*	5RD083	ROADWAY PLAN - NB 121B (RIGHT)		
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	5RD102	MANAGED LANE PROFILE - WEBSH114		
*	5RD103	MANAGED LANE PROFILE - WEBSH114		
*	5RD104	MANAGED LANE PROFILE - WEBSH114		
*	5RD105	MANAGED LANE PROFILE - WEBSH114		
	5RD106	MANAGED LANE PROFILE - WWBSH114		
*	5RD107	MANAGED LANE PROFILE - WWBSH114		
*	5RD108	MANAGED LANE PROFILE - WWBSH114		
*	5RD109	MANAGED LANE PROFILE - WWBSH114		
*	5RD110	MAIN LANE PROFILES - SB 121B		
*	5RD111	MAIN LANE PROFILES - SB 121B		
*	5RD112	MAIN LANE PROFILES - SB 121B		
*	5RD113	MAIN LANE PROFILES - SB 121B		
*	5RD114	MAIN LANE PROFILES - SB 121B		
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	5RD119	MAIN LANE PROFILE - NB 121B		
*	5RD120	MAIN LANE PROFILE - NB 121B		
*	5RD121	MAIN LANE PROFILE - NB 121B		
*	5RD122	MAIN LANE PROFILE - NB 121B - INTER		
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*	5RD124	MAIN LANE PROFILE - EB SH114		
*	5RD125	MAIN LANE PROFILE - EB SH114		
*	5RD126	MAIN LANE PROFILE - EB SH114		
*	5RD127	MAIN LANE PROFILE - EB SH114		
*	5RD128	MAIN LANE PROFILE - EB SH114		
*	5RD129	MAIN LANE PROFILE - EB SH114		
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*	5RD131	MAIN LANE PROFILE - WB SH114		
*	5RD132	MAIN LANE PROFILE - WB SH114		
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*	5RD134	MAIN LANE PROFILE - WB SH114		
*	5RD135	MAIN LANE PROFILE - WB SH114		
*	5RD136	MAIN LANE PROFILE - WB SH114		
*	5RD137	MAIN LANE PROFILE - WB SH114		
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	5RD139	DIRECT CONNECTOR PROFILES - DCE114SIP		
*	5RD140	DIRECT CONNECTOR PROFILES - DCE114SIP		
*	5RD141	DIRECT CONNECTOR PROFILES - DCN14N121		
*	5RD142	DIRECT CONNECTOR PROFILES - DCE114NIP		
*	5RD143	DIRECT CONNECTOR PROFILES - DCE114NIP		
*	5RD144	DIRECT CONNECTOR PROFILES - DCE114NIP		
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*	5RD147	RAMP PROFILES - RMPSTX		
*	5RD148	RAMP PROFILES - RMPSTX		
*	5RD149	RAMP PROFILES - RMPNE121		
*	5RD150	RAMP PROFILES - RMPNE121		
	5RD151	RAMP PROFILES - RMPNE121		
*	5RD152	RAMP PROFILES - RMPNTX		
*	5RD153	RAMP PROFILES - RMPNTX		
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*	5RD156	DEFERRED RAMP PROFILES - RMPEWR114		
*	5RD157	DEFERRED RAMP PROFILES - RMPWAIR		
*	5RD158	DEFERRED RAMP PROFILES - RMPWAIR		

NOTE:

* INCLUDED IN THIS SUBMITTAL

RELEASE FOR CONSTRUCTION

ISSUE RECORD		
NO.	DESCRIPTION	DATE
C	FINAL DESIGN SUBMITTAL	[illegible]
0	RELEASE FOR CONSTRUCTION	25FEB10
1	FINAL DESIGN SUBMITTAL - ENTIRE SHEET	19APR10
2	RELEASE FOR CONSTRUCTION - ENTIRE SHEET	19MAY10
3	FINAL DESIGN SUBMITTAL - ENTIRE SHEET	16JUN10
4	RELEASE FOR CONSTRUCTION - ENTIRE SHEET	24AUG10

NorthGate Constructors

PB Parsons Brinckerhoff Americas Inc. TBPE ID 2263

DFW CONNECTOR PROJECT
AREA 5 ROADWAY
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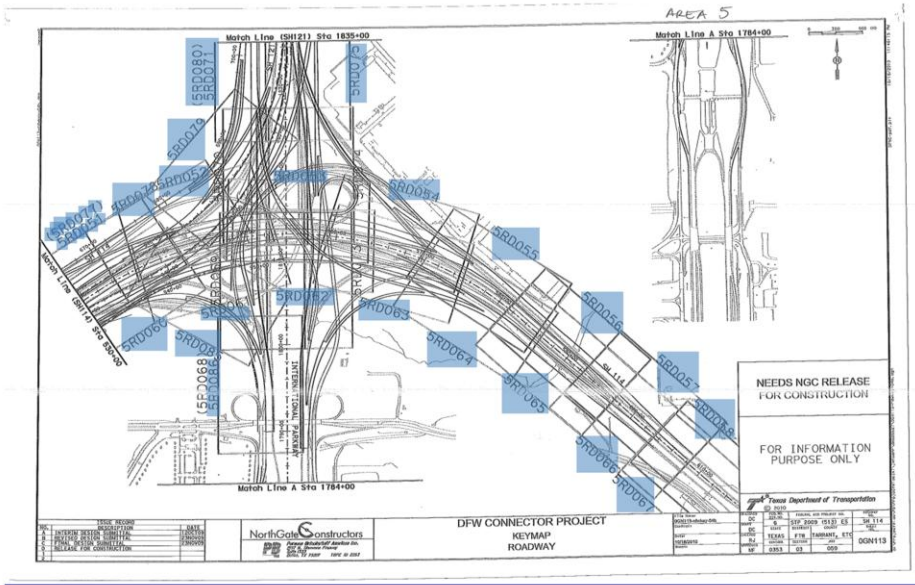
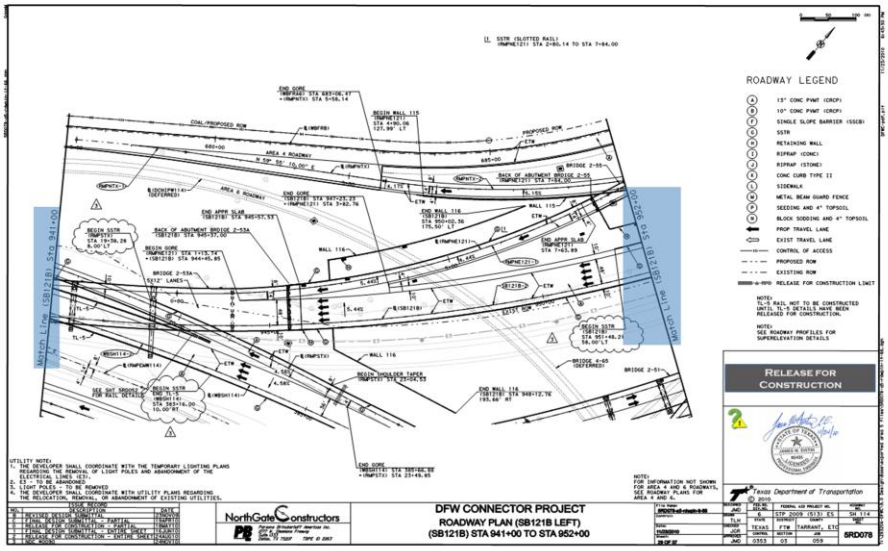
Texas Department of Transportation © 2010

Designed	JMD
Drawn	TLH
Checked	JGR
Approved	JMD
Fed. Rd. Div. No.	6
Federal Aid Project No.	STP 2009 (513) ES
Highway No.	SH 114
State	TEXAS
District	FTW
County	TARRANT, ETC
Control	0353
Section	03
Job	059
Sheet No.	5GN101
Sheet	1 OF 2

RFC Drawing Keymap(Hyperlinks Shown)

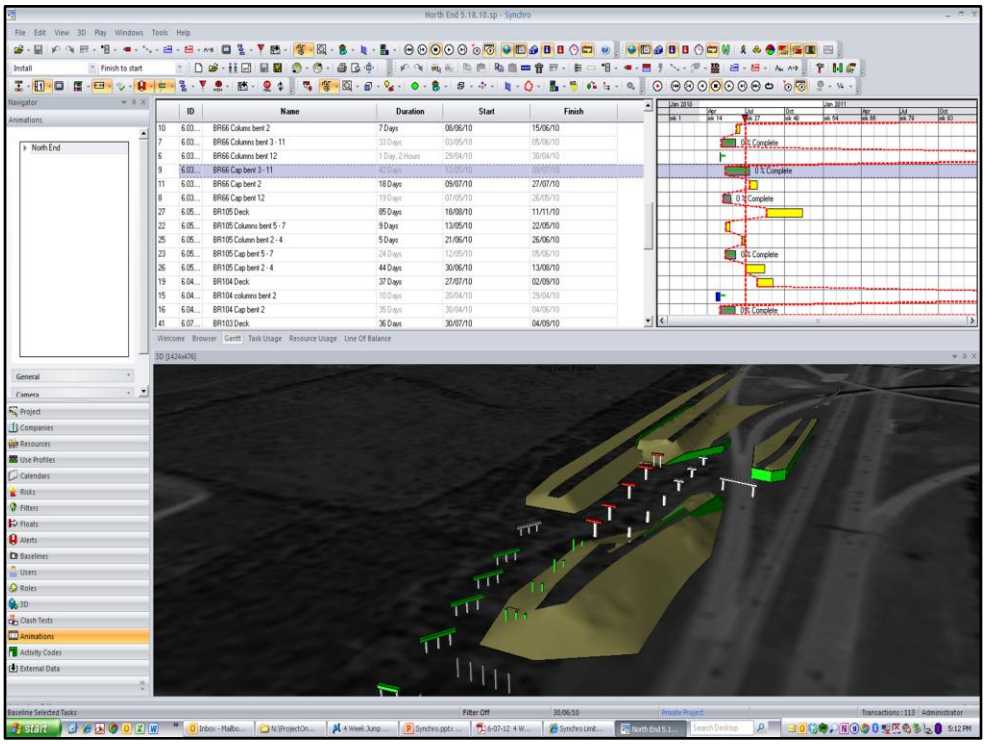


RFC Drawing(Hyperlinks Shown)



Kiewit

4-D Scheduling



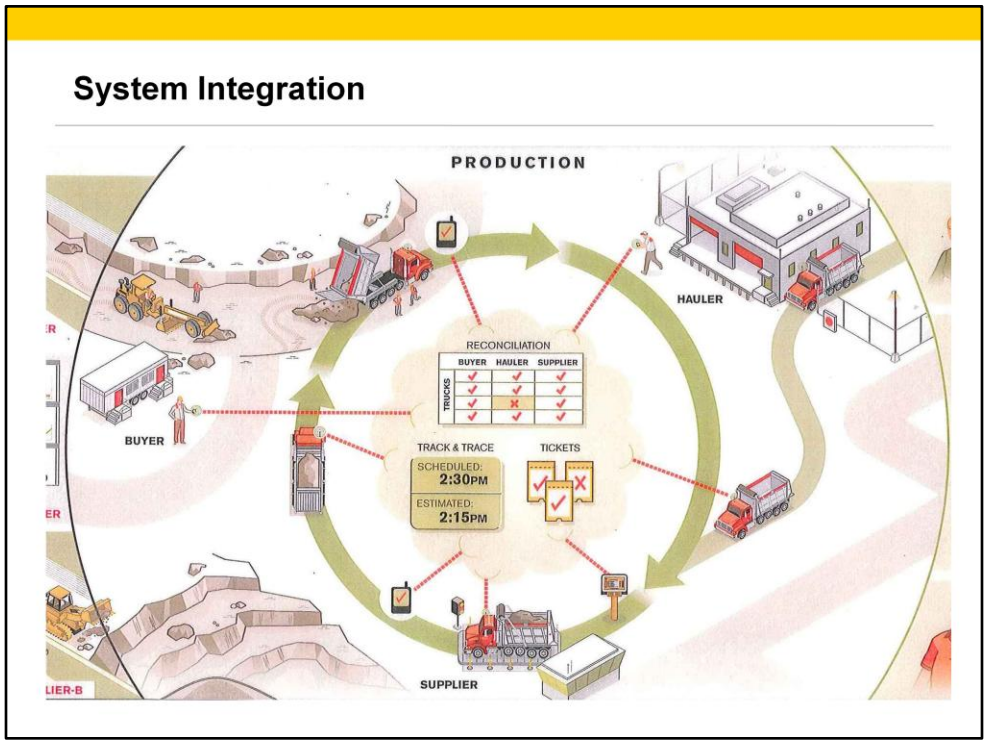
4-D Scheduling is simply linking your Primavera P6 Schedule to your 3D design model. The research that our team performed led us to a program called Synchro.

Synchro is a program that is very easy to use and provides a great tool for analyzing your schedule as well as explaining it to other including non-technical 3rd Parties such as cities, counties, local jurisdiction and the general public. It allows you to either hit ”play” which will show the project develop as the timeline moves through the schedule or select any point in time where you can then visually see what the project will look like at that point.

Unfortunately we were not fully successful in using this technology on our project. Where we failed was not matching the level of detail in our design model to the detail in our schedule. It started with our contract requirement to use GeoPak software to provide the design. This software did not have as robust modeling as the Bentley products available.

Knowing what we learned, we are better suited today to match our design model to our schedule. This will make 4D scheduling more seamless in the future.

FiveCubits



Five Cubits is a two part solution:
1) a web-based software designed to electronically integrate a buyer with its suppliers & haulers throughout the purchasing process of bulk materials.

2) a GPS fleet tracking and driver timecard solution for real-time truck management.

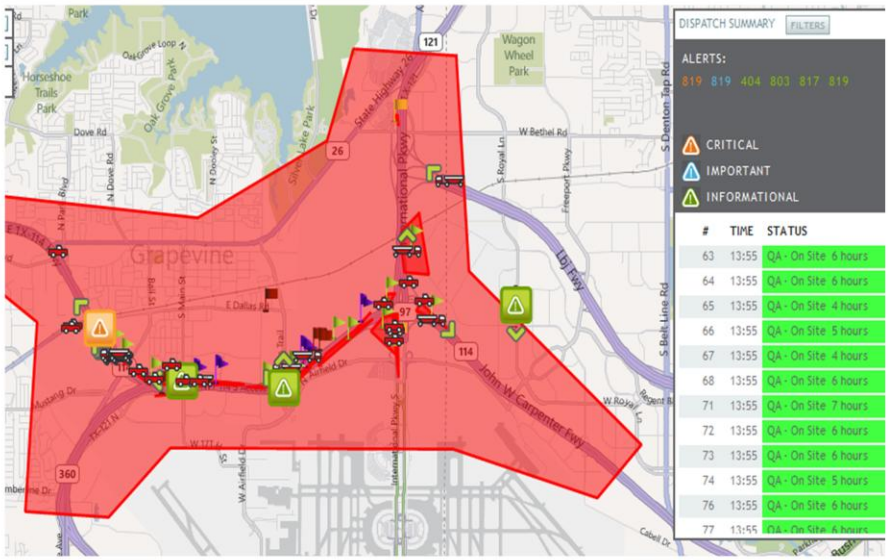
Material Management

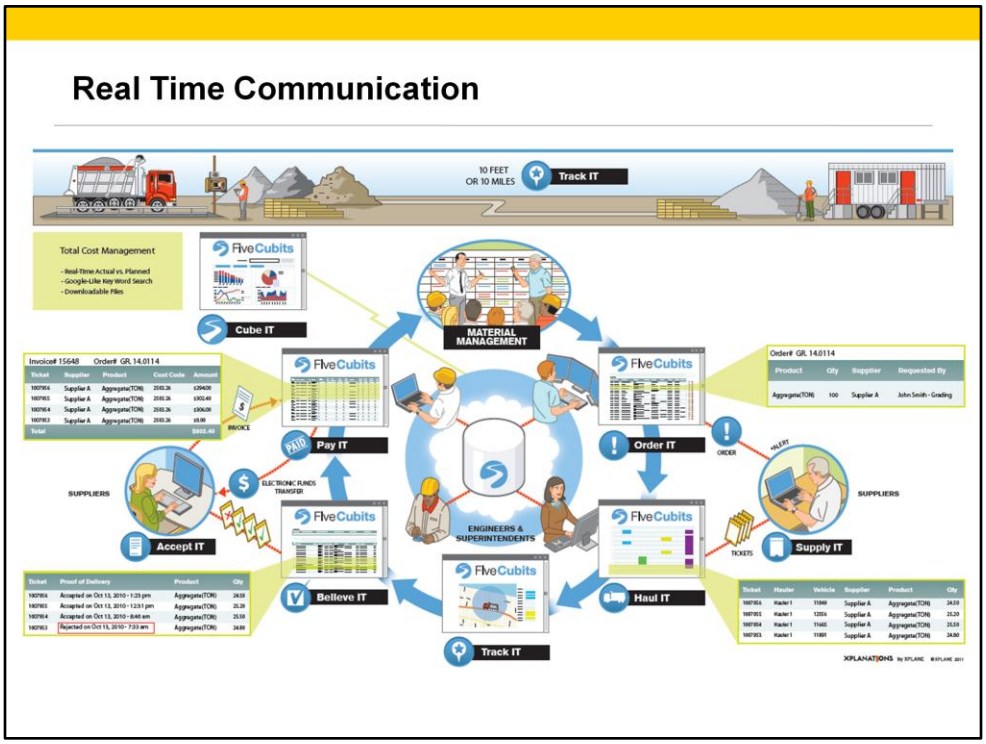
Automated Scale Kiosk

Trucking Management

Equipment	Trip	Trip Count	Total Time	Ave Time	Min Time	Max Time
6 - 6	Loading - Returning	5	301.47	60.29	53.82	63.72
11 - 11	Loading - Returning	7	462.95	66.14	55.73	92.42
13 - 13	Loading - Returning	6	404.40	67.40	49.47	92.50
15 - 15	Loading - Returning	7	528.43	75.49	59.38	113.95
21 - 21	Loading - Returning	7	472.80	67.54	46.72	82.83
26 - 26	Loading - Returning	6	298.68	49.78	31.37	67.40
36 - 36	Loading - Returning	6	402.40	67.07	59.72	74.40
38 - 38	Loading - Returning	7	490.15	70.02	47.97	120.53
106 - 106	Loading - Returning	6	370.70	61.78	56.05	65.15
	TOTAL:	57	3731.98	65.47	31.37	120.53

Staff Management





Uniform management of all permanent materials

Real time info sharing between Owner → contractor → supplier → subcontractor

Low Cost Trucking Operations

Minimize Carbon Footprint

Minimize Overhead needed to manage operations

Kiewit

Machine and Grade Control

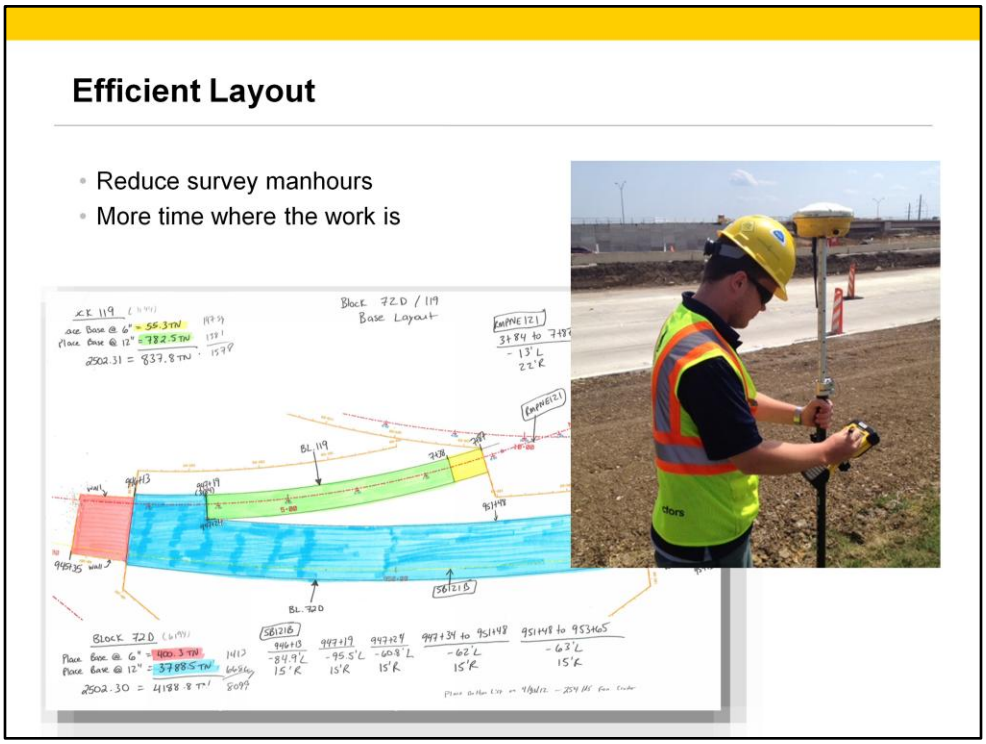
The Rover

Data Collector

Rover GPS

Just about everyone on this job has familiarity with Microstation, as it's the program all of us use for our takeoffs and to develop our visuals. InRoads works within Microstation to provide the 3D aspect and allow us to develop cross-sections, cut and fill maps, contours, and several other useful things that we use all the time and put into our work packages for the crews. SCS Data Manager is the program that syncs the work you create on the rover with your computer to then be transferred and used within Microstation. And lastly the Business Center which is almost exclusively used by survey to create the models that we use in our equipment. However there has been some effort to get this ability into the hands of the engineer as well.

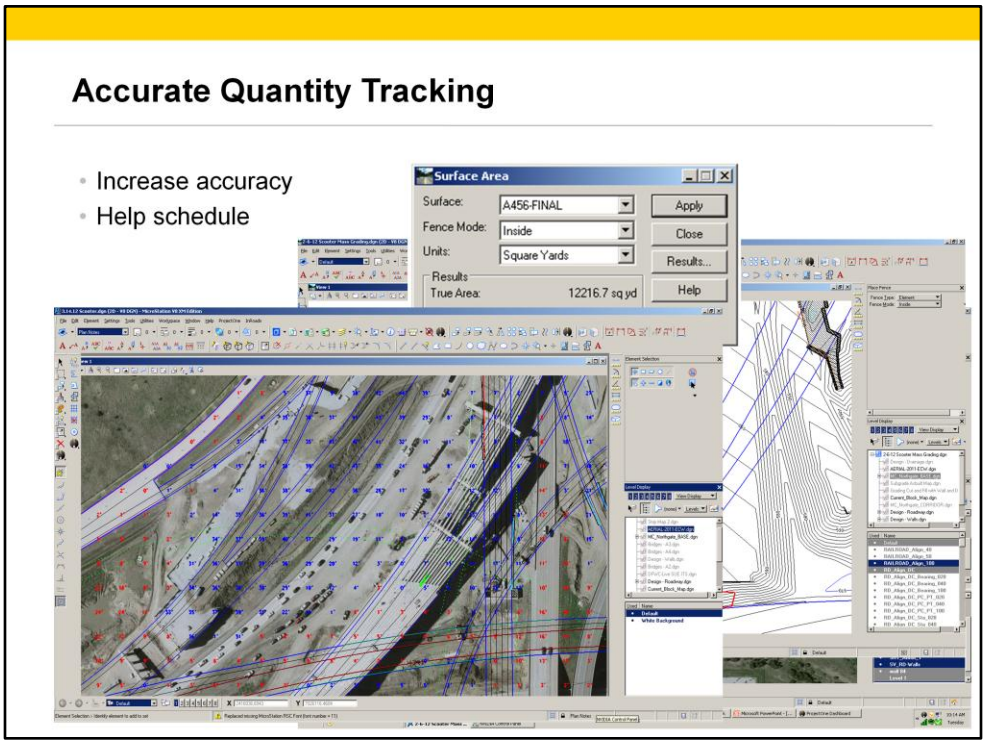
What you see here are the components that make up the rover: The data collector and the receiver. The data collector communicates with the receiver and is easily attached to a rod and operated using the buttons and a stylus. The receiver communicates with satellites to acquire its GPS location. Using Microstation in hand with the SCS Data Manager, we can transfer any drawing done on our computers to the rover and locate it in the field. The equipment it self is actually much easier to use than one might imagine. I had 2 or 3 short trainings with other experienced engineers before I was out using it on my own.



We've been using the rover more and more to layout our work. In grading, working to our limits is one of our major quality concerns and focuses. Being able to stake out our edges of lime and base provides us and our crews with a good sanity check out in the field. One engineer can go out into the field with the rover and stakes and lay out any line. Most often, we layout our edges of pavement with a 4 foot offset to represent our edge of base. This way, our crews know that as long as they are building out to the stakes, they are reaching they're limits.

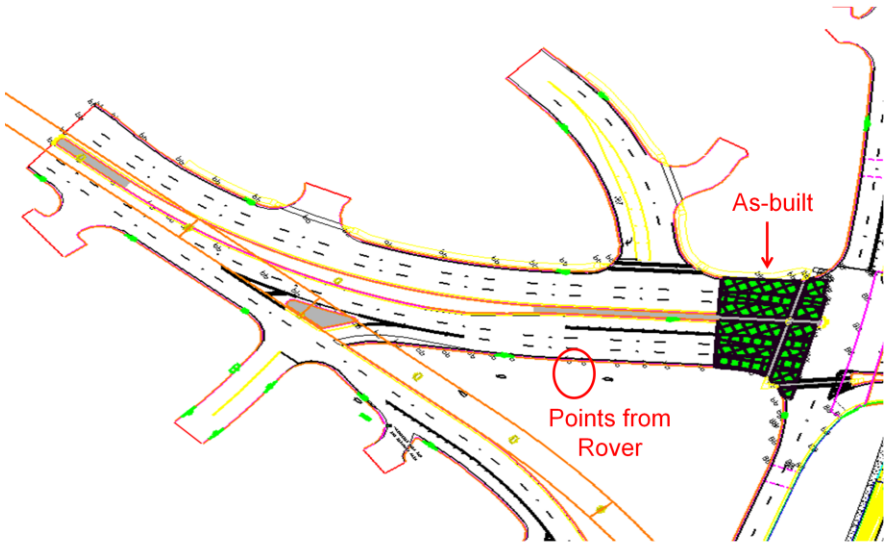
Another useful reason for layout is to protect our finished work. Recently, I worked with the drainage engineers to layout some of their finished RCP so that when our grading crews came through, they would know where these pipes are and at what depth and could perform they're cut while taking care not to create rework.

As you can see one of the main bullet points on this is it reduces our reliance on the surveyors. The ratio of crew members to surveyors to support them estimated on this job was 13:1. To-date we are at a 14:1. Recently, we have been running at an 18:1. So this puts our projected ratio at 16:1. This is all do to the fact that more and more engineers are learning to pick up the rover and handle survey tasks themselves. This is especially crucial when we have emergency situations and are unable to get a survey request in with the standard 48 hour notice. Don't get me wrong, the surveyors have yet to turn me down when I have a urgent situation, but being able to handle many of these tasks yourself is valuable. As I said earlier, the rover works using satellites, which makes you unable to acquire a signal under cover of bridges and sometimes too near high walls. It is in these circumstances that it is important to look ahead and get survey out there. The other key benefit to laying out our own work, in my mind, is it creates exposure to the field for engineers like myself. Anyone who has ever been an engineer



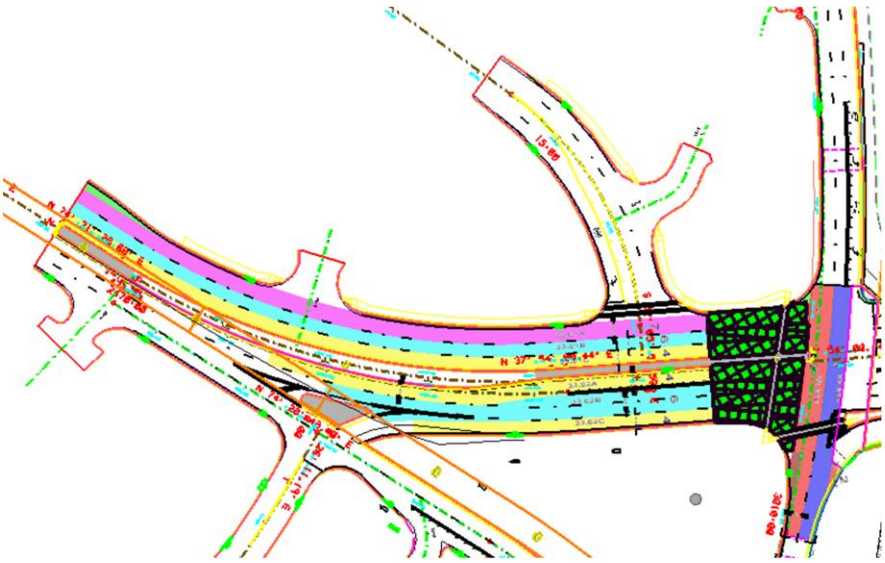
Another major benefit of the rover is it allows us to more accurately quantify the work we're doing. I personally use it to help track and claim my demo, slope work, topsoil, etc. An example of how I do this is to go out in the field after we've had the concrete breakers come through and take points along the perimeter of the break areas. The closer the points are, the more accurate you can get. After shooting the points, syncing the data collector with my computer, and uploading the points into Microstation using InRoads, I can lay these points directly over our aerial view of the project and, using the perimeter, create the shape of my broken area. {CLICK} Then I simply calculate the area. Within InRoads, we can compare areas like this to our design grade and find true areas, which is necessary when working on slopes. Another key way we use this is to take topo points throughout our work areas in order to see how much cut and fill we have to reach proposed grade. This helps our superintendents to create a more accurate schedule. In taking points this way, you essentially create your own model of the grade in the area and compare it to the final design model and InRoads calculates your cut and fill volumes.

Concrete Paving



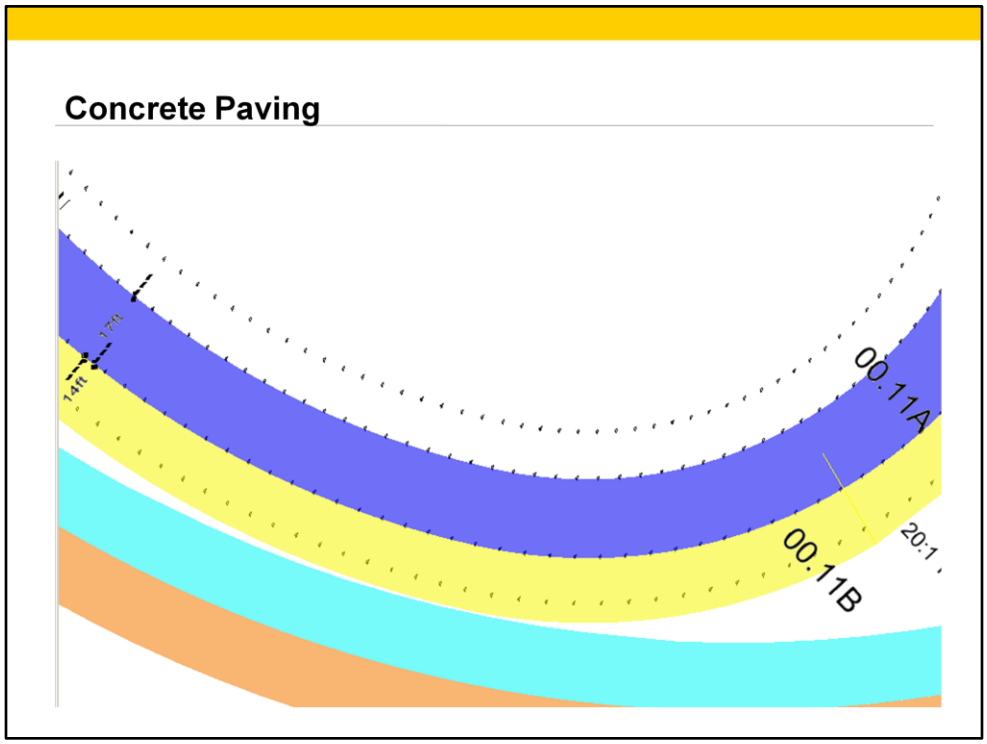
The roadway design, traffic lines, walls, columns, drainage plans, and bridge plans are all referenced and displayed in MicroStation.
An As-built layer is also updated daily to know what paving has been previously completed
A rover is used to take points along the edge of the constructed base or bond breaker. This is how we know what work is available

Concrete Paving



The key to drawing strip maps is knowing the capabilities of the pavers available. Try to maximize high production paving while minimizing HPs, forms, paver changes, and paver moves. Minimizing duration and phasing paving pulls so cure time isn't needed also comes into play.

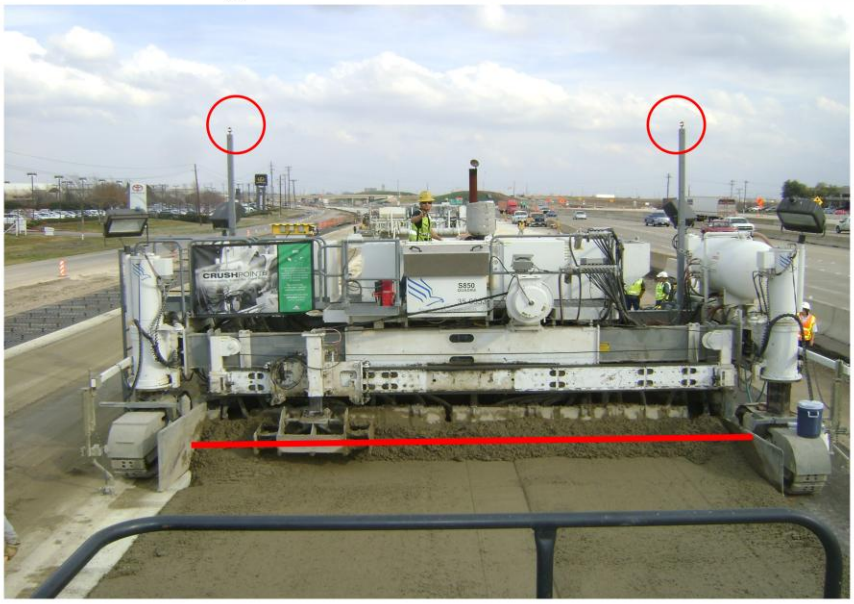
In MicroStation the paving pulls are labeled, dimensioned, and phased. After this they are sent to survey so a Leica model can be built.



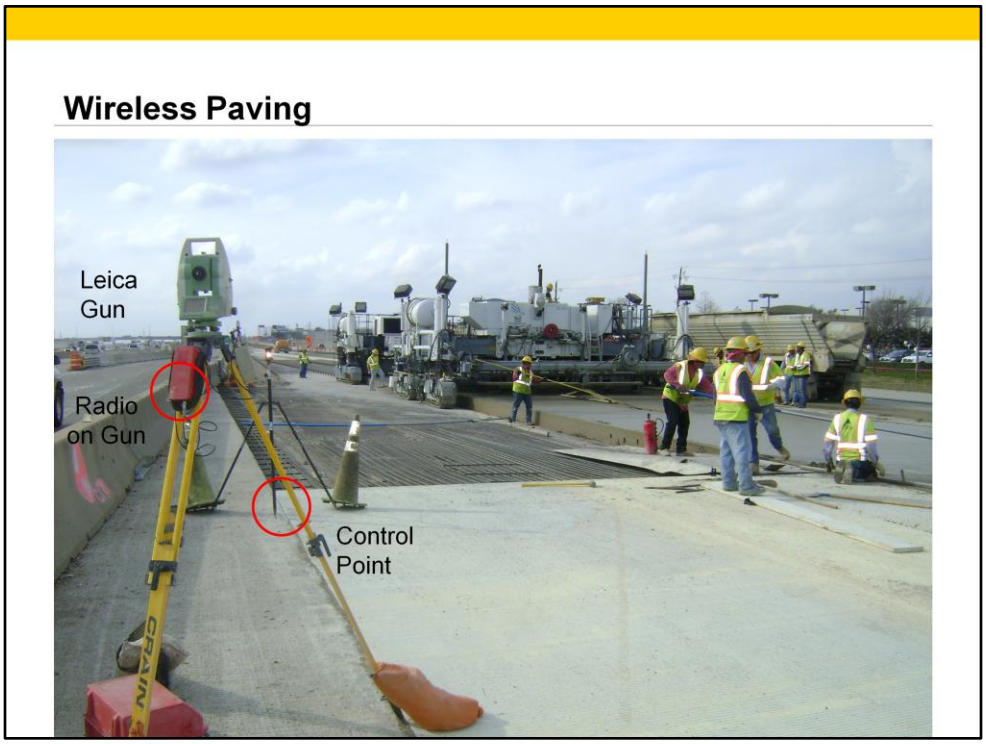
The black points are a 2D look at what a Leica model is. There are four lines in a model. Two follow the alignment of the road (used to steer the paver) and the other two are offset beyond the pull to create a surface wider than the alignment to guide the cross slope of the paver.

The paver steers by always aiming for the next point in the model.

Wireless Paving



The paver is calibrated so that the pan knows where it is in relationship to the reflective prisms that tower over the paver.



Leica guns are set up about every 300’ along the paving pull. 3 control points are shot with the gun so it knows where it is. The gun then follows the prisms on the top of the paver. It communicates with radios the exact location of the paver so it can follow the model.

Wireless Paving

The Leica model is loaded into the computer hooked up to the paver. The foreman uses the cut sheet and the fills surveyors write on their alignment nails to check the depth of the pour and ensure that the model doesn't need any adjustments.

Cut sheets are made so foreman can check their slab thickness during the pour.

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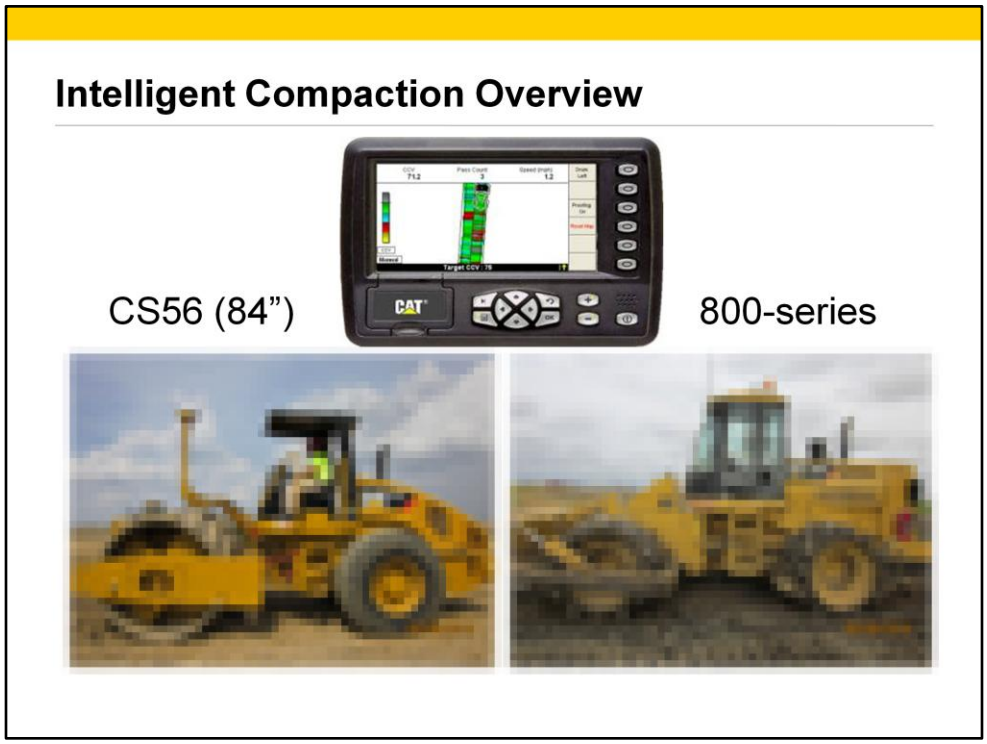
Intelligent Compaction



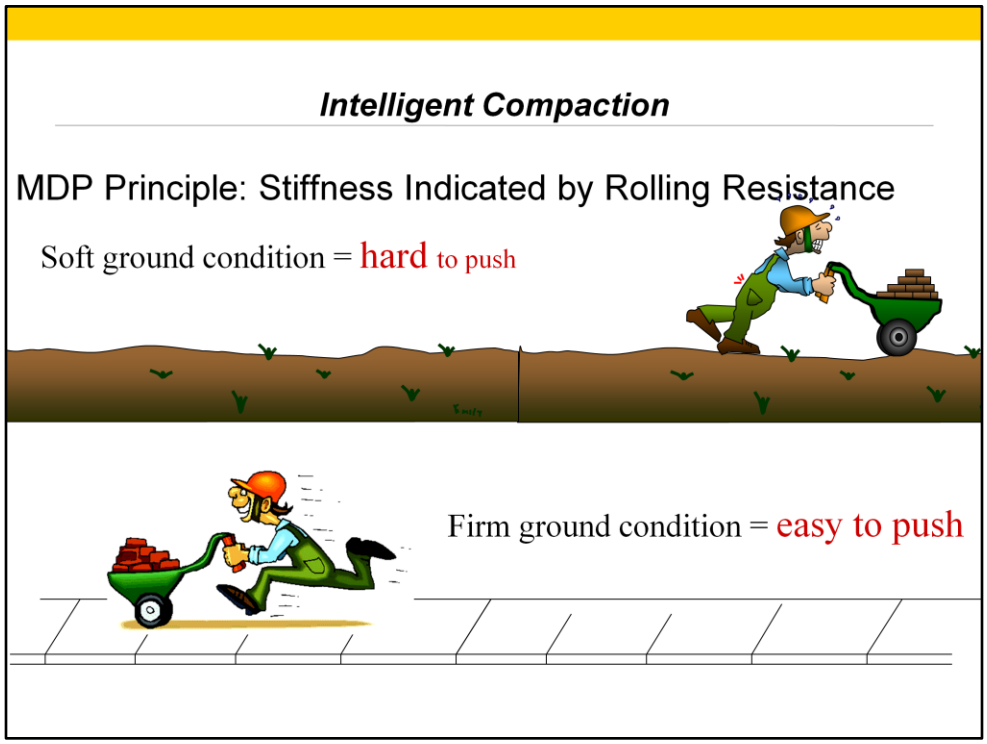
We have been using two different IC technologies on the DFW connector project since July of last year.

The first is the Compaction Meter Value system (CMV) **which has a drum mounted accelerometer that measures G-force of the vibratory frequency and harmonics.**

The second technology is the Machine Drive Power (MDP) system that **measures the rolling resistance while compensating for the grade slope.**

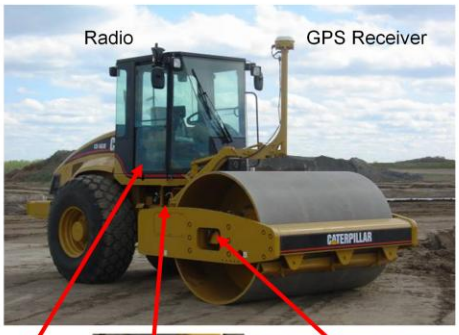
MDP system is our primary method used for mapping all materials

We are using the CMV and MDP technology on the CS-56 and the MDP technology on the 815 series machines.



30 seconds: How hard does the engine have to work to push the machine through a material. Imagine the effort used trying to push a loaded wheelbarrow through beach sand versus pushing it over a concrete surface. It takes more effort to push the wheelbarrow through the sand. This measurement is displayed as a unit-less value called a CAT Compaction Value (CCV). Essentially what is being indicated is not a density or moisture reading, but how the soils actually perform as the machine rolls over it

Intelligent Compaction



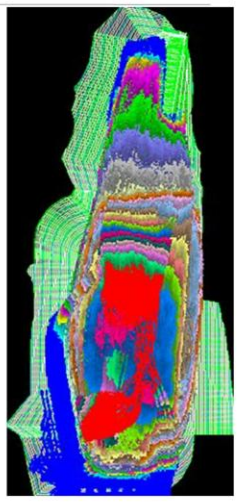
Controllers

Slope Sensor

Accelerometer

Intelligent Compaction Value Points

- Site Transparency
- Process Control
- Higher Confidence in Site Quality
- Streamlines Operator Training



There **number one benefit of using IC** is that once the material type is tested using the LWD, DCP and PLT, a target machine value can be set that **relates directly to the paving design parameters** not an obscure nuclear density value.

Once the target value is reached, the monitor is set to show that area in green. **As the display fills in with the corresponding colors ranging from well compacted to uncompacted, the condition of the area becomes transparent**.

This is an excellent process control tool because **those areas that may need more work are easily recognizable** well before quality testing is complete.

Since IC maps the entire area there is a higher confidence in the condition of the site as apposed to a random nuclear density test on one area of the grade.

The IC system provides seamless operator training in that system set up is easy to learn and the operator see the progress as he completes his work. An operator can be taught set up and operation in less than a day.

Typical IC Report

Company/Sub: North Gate
Weather: Clear
Date: 5/6/2011
Day of Week Friday
Block: 65
Spec. Section: 132
Activity# 4.65.GR.EM.11
Activity Name: Embank Second Six Lift of Base
Discipline: Grading
Location: Block 65 Sta.490+00 65'RT' - 160"RT'- Sta. 499+80 65"RT - 160' RT (SH114)

Type of Work Performed: Embank Base (2nd Six Lift)

Daily Work Log:

Bill with NorthGate requested QC to perform the I.C. proofing run at the above location. QC performed the proof mapping with 93% of the map area equal to 100%+ of the 135 CCV, 06% of the map equal to 90%+ of ccv value of 135 for a total 99%, the avg. ccv ranged from 138-142

A LWD test was performed where QA received a passing density 97+%. The results were 140.9 CCV/ 59.7 MN/m /= 8,658.7 psi.

Note: Ref. attached DCP Report

Tests/Inspections Performed: Moisture Density QA, I.C. Map, LWD QC

Who Tested/Inspected: Ryan M. QA, Roy S.

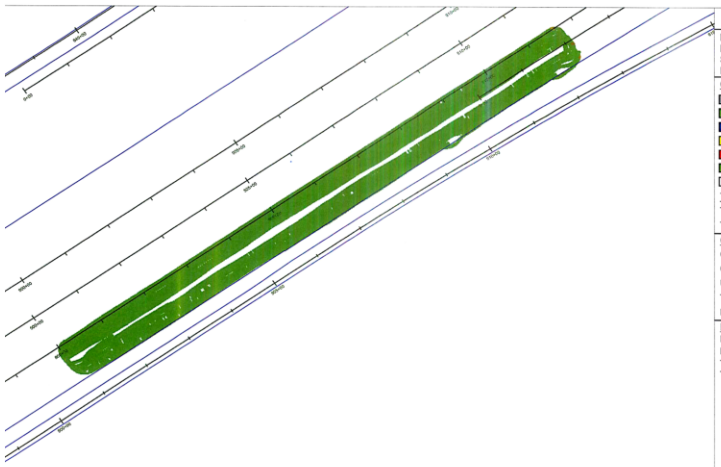
Delays Encountered and Reasons: NA

NCR/Deficiencies: (New or Worked On) NA

Note: All ACTIVITIES MENTIONED ABOVE, EXCEPT AS NOTED, WERE PERFORMED IN ACCORDANCE TO THE PLANS, SPECIFICATIONS, AND SPECIAL PROVISIONS

A typical report will contain a narrative, an RICM Proof Roll Map containing the test locations, LWD, DCP and PLT test results.

Typical IC Report



Compaction Report

Data Model: DFW SITE
Display: CCV %
Site: DFW
Date: Saturday, April 30, 2011

Compaction Analysis

> 120.0%	(0%)
100.0%	(96%)
90.0%	(4%)
80.0%	(0%)
0.0%	(0%)
Target CCV	
Decoupled	

Target CCV
Target Range: 90% - 115%
Target CCV: 135.0

CCV % Summary
Overcompacted: 0%
Compacted: 100%
Undercompacted: 0%
Total Area Covered: 94832.1 sq FT
Duration: 1h:32m:29s

Filter Settings
Filter: <Not Specified>
Machine: 2CS56 11-1753
Time Start: 4/29/2011 - 01:01:25 pm
Time End: 4/29/2011 - 02:33:54 pm

Plate Load Testing

A specification for the use of IC has been approved by the TxDOT Specification Review Board in Austin, FHWA and submitted for use on the DFW project.
we need to continue on-site training for our operators, staff engineers and foreman.
As the technology develops, the MDP system is still being evaluated and refined, **we need to review the machine responses to differing material and the data collected to further develop the technology** in partnership with the Caterpillar research group.

We need to keep the technology visible to both our own people and the Owners and help them to understand the way it works and the benefits of using the technology.

You can bet this technology will be used in future design-build and bid build projects. If we understand it better than any other contractor **Kiewit will have the advantage on future projects**.

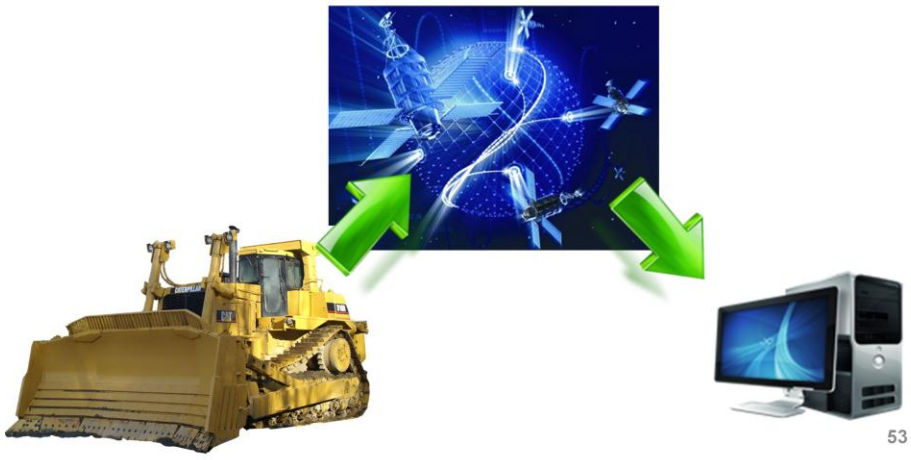
As this technology and our understanding advances, Kiewit will enjoy the benefit of **fewer compaction tests and lost time while waiting for a proctor. The bottom line is lower production and Quality Control costs**.

Kiewit

Equipment Telematics

Telematics

- Communication of Machine Data to Data Base (Remotely Accessible)



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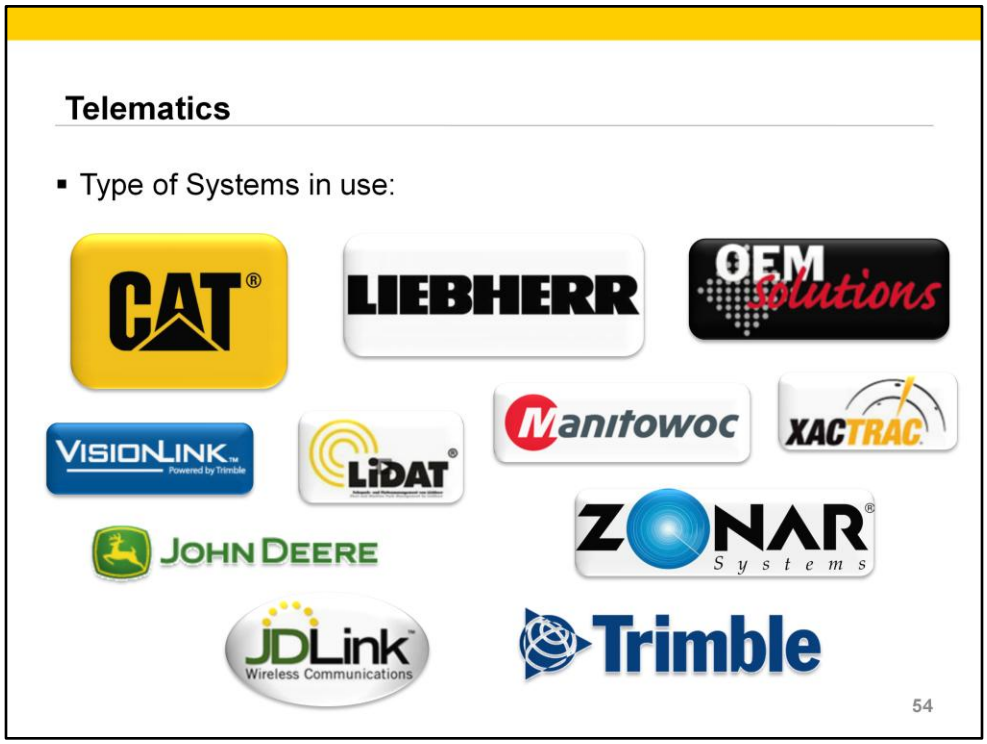
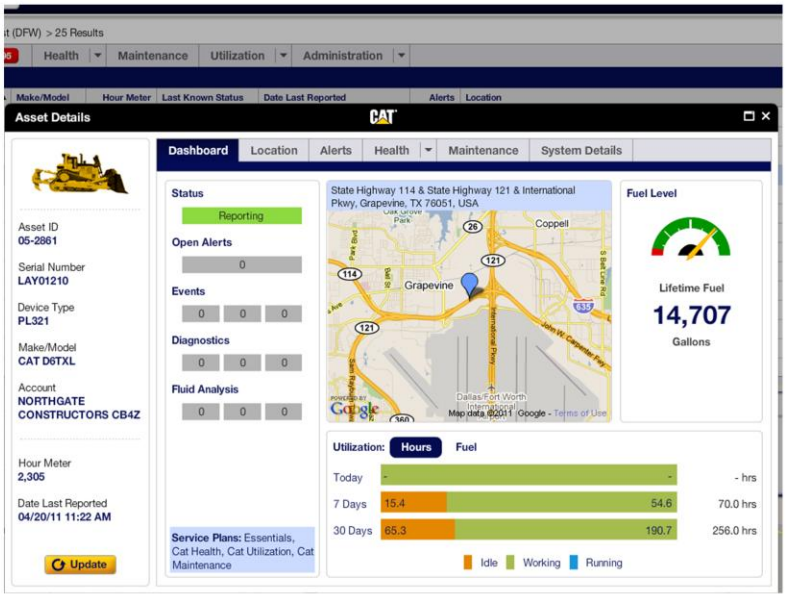
Definition of Telematics – Integrated use and transmission of fleet information via the web. Information can be organized and sorted to provide a wide array of reports to improve fleet management, safety and efficiency.



There are basically two types of Telematic Systems that we are currently using, first is the manufacture systems that come with current models of Caterpillar, John Deere, Manitowoc and Liebherr equipment.

The second type is an aftermarket system that can be added to both new and older equipment such at OEM Solutions, Xactrac, Vision Link and Trimble.

Telematics



Information available for manufactures systems include:

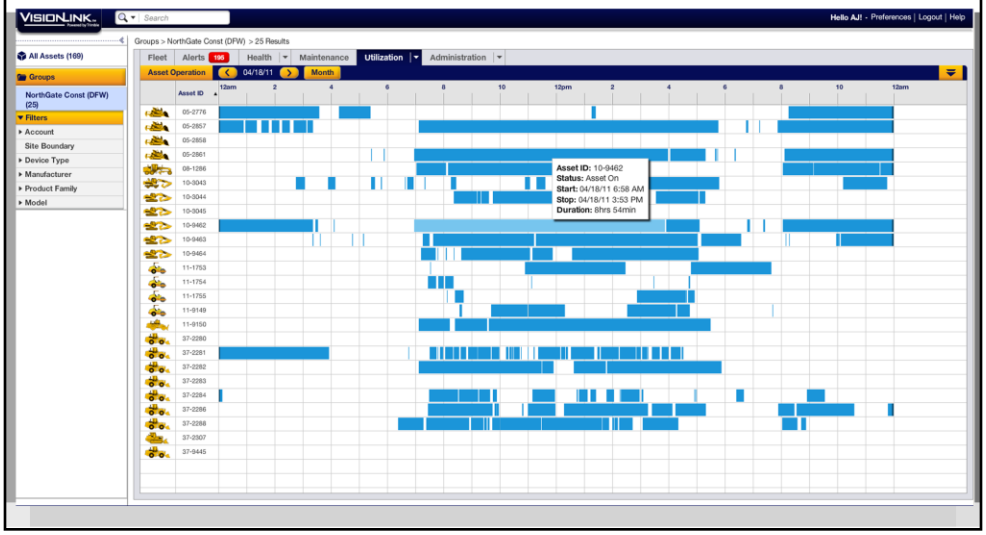
1) Operational condition of the machine. Diagnostics of operating systems on the machine, potential faults, useful life of fluids such as engine and hydraulic oils
2) History of idle versus production hours

Our monitoring of excess idling on our project will save millions of dollars. A simple reduction of fuel consumption by 10% saves 1 million gallons of fuel.

Additionally, excess idling of equipment increase wear on the machines, reduces warranty period and is bad for the environment.

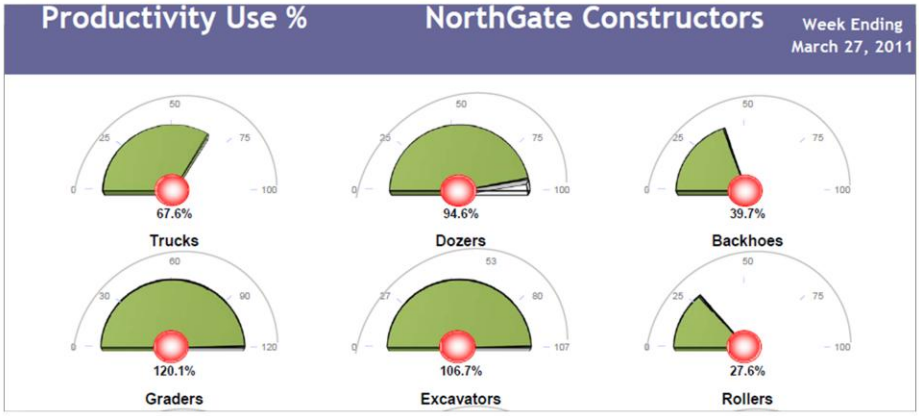
Telematics

Daily Utilization Detail



Using information gathered from telematics also allows us to better manage our fleet on the project. Simple bar charts are accessible that shows production hours and available hours for equipment. Having this infomration has allowed us to easily adjust shifts for optimize the equipment and reduce outside rent.

Telematics



Here is another sample of a utilization graph that is available to manage the fleet

Telematics

Cellular Device

Satellite Device

Telematics

- Aids in the planning and scheduling of our operations

Reduces man hours for locating equipment

Maximizes utilization and reduces need for outside rent

Tracks idling and fuel consumption (idle vs. productivity)

Stolen equipment recovery

Reports engine fault code alerts

Telematics


Mapped Assets
Idle
[03-0139] KENWORTH T-800B
WATER TRUCK
Connector 635 Yard
My Assets
Event Icon Legend
GPS Lock
Idle
Ignition On
Ignition Off
Lockdown
Ping
Programming
Sleep
Speeding
Wake Up
Battery Disconnect
Exit GeoFence
Enter GeoFence
Satellite Tag
Battery Low
All Other Events
Grapevine
Carpenter
Dallas-Fort Worth International Airport
Founders Plaza
DFW Airp
0.7 miles

Telematics

- Real time accurate equipment location
- For use by production to plan their operations
- Quick and easy sorting by equipment type or prefix
- Very user friendly, but only for equipment location

Smart Lube Truck

Modern Lube Truck Technology

Benefits from Technology

Real time equipment and asset location
Maximize equipment utilization
Equipment hours updated daily
Fuel records recorded and uploaded automatically
Reduce and eliminate man hours
Eliminate possible man made errors
Method analysis / route planning
Reduces / controls idling and fuel waste
Help provide high quality productivity at low cost

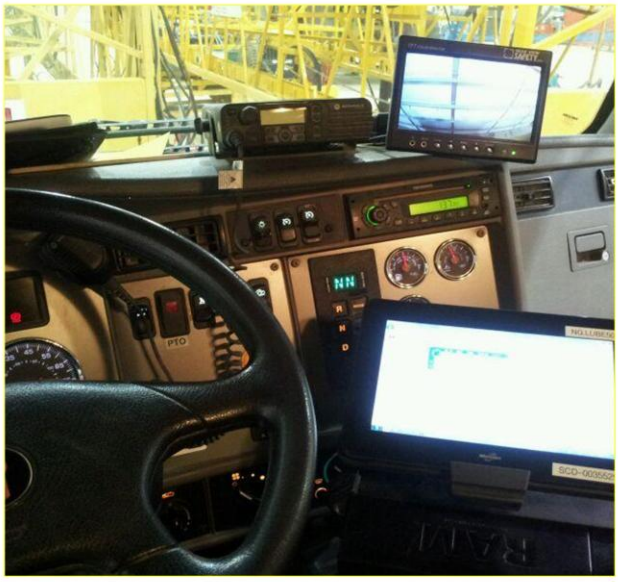
Smart Lube Truck

System at the Fuel Farm

- Accurately records fuel dispensed into the lube trucks
- Reports the fuel pumped to their on-line data base
- Eliminates man hours and errors in record keeping

“Smart” Lube Truck

Motion tablet enables lube tech to access telematic information from the truck.



Smart Lube Truck

- Computer Display Screen
  - Displays a list of equipment within a 200 ft. radius
  - The meter hours are displayed for the selected unit
  - Tracks and records the fuel and oil dispensed
  - Eliminates man hours and possible error in records


Kiewit
Infrastructure Group
Civil Integrated Management
Rob Anderson and Justin Mannina